ULTRASONIC IMAGING

An International Journal

Editor-in-Chief
MELVIN LINZER

Associate Editors
A. C. KAK
T. H. SHAWKER
P. N. T. WELLS

VOLUME 6, 1984

ACADEMIC PRESS, INC.
(Harcourt Brace Jovanovich, Publishers)
San Diego Orlando New York London

Copyright © 1984 by Academic Press, Inc.
All rights reserved

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in writing from the copyright owner.

The appearance of the code at the bottom of the first page of an article in this journal indicates the copyright owner's consent that copies of the article may be made for personal or internal use, or for the personal or internal use of specific clients. This consent is given on the condition, however, that the copier pay the stated per copy fee through the Copyright Clearance Center, Inc. (27 Congress Street, Salem, Massachusetts 01970), for copying beyond that permitted by Sections 107 or 108 of the U. S. Copyright Law. This consent does not extend to other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale. Copy fees for pre-1984 articles are the same as those shown for current articles.

0161-7346/84 $3.00

MADE IN THE UNITED STATES OF AMERICA

Contents of Volume 6

Number 1, January 1984

D. E. Robinson and M. Wing. Lateral Deconvolution of Ultrasonic Beams 1

C. R. Meyer, D. S. Herron, P. L. Carson, R. A. Banjavic, G. A. Thieme, F. L. Bookstein, and M. L. Johnson. Estimation of Ultrasonic Attenuation and Mean Backscatterer Size via Digital Signal Processing 13

Roman Kuc. Modeling Acoustic Attenuation of Soft Tissue with a Minimum-Phase Filter ... 24

K. A. Morrish, M. Stone, B. C. Sonies, D. Kurtz, and T. Shawker. Characterization of Tongue Shape 37

P. E. Nikravesh, D. J. Skorton, K. B. Chandran, Y. M. Attarwala, N. Pandian, and R. E. Kerber. Computerized Three-Dimensional Finite Element Reconstruction of the Left Ventricle from Cross-Sectional Echocardiograms 48

Chandra M. Sehgal and James F. Greenleaf. Scattering of Ultrasound by Tissues 60

A. H. Andersen and A. C. Kak. Simultaneous Algebraic Reconstruction Technique (SART): A Superior Implementation of the Art Algorithm 81

Z. Q. Lu, M. Kaveh, and R. K. Mueller. Diffraction Tomography Using Beam Waves: Z-Average Reconstruction 95

S. A. Johnson, Y. Zhou, M. K. Tracy, M. J. Berggren, and F. Stenger. Inverse Scattering Solutions by a Sinc Basis, Multiple Source, Moment Method—Part III: Fast Algorithms 103

Number 2, April 1984

N. F. Maklad, J. Ophir, and V. Balsara. Attenuation of Ultrasound in Normal Liver and Diffuse Liver Disease *in Vivo* 117

Shmuel Shaffer, D. W. Pettibone, J. F. Havlice, and M. Nassi. Estimation of the Slope of the Acoustic Attenuation Coefficient 126

August Vieli, Joseph Heiserman, Ingela Schnittger, and Richard L. Popp. An Improved Stochastic Approach to RF Amplitude Analysis in Ultrasonic Cardiac Tissue Characterization 139

R. Vaknine and W. J. Lorenz. Lateral Filtering of Medical Ultrasonic B-Scans before Image Generation 152

H. E. Melton, Jr., and P. A. Magnin. A-Mode Speckle Reduction with Compound Frequencies and Compound Bandwidths 159

S. W. Smith and R. F. Wagner. Ultrasound Speckle Size and Lesion Signal to Noise Ratio: Verification of Theory 174

A. J. Devaney and G. Beylkin. Diffraction Tomography Using Arbitrary Transmitter and Receiver Surfaces 181

T. L. Rhyne and K. B. Sagar. Analysis of Random Backscatter in the Presence of Static Reflection Components 194

Program and Abstracts. Ninth International Symposium on Ultrasonic Imaging and Tissue Characterization, June 3–6, 1984, Washington, D.C. 201

Comment

H. G. Larsen and S. C. Leavitt. Comments on Robinson, D. E., and Knight, P. C. Interpolation Scan Conversion in Pulse Echo Ultrasound, *Ultrasonic Imaging* **4**, 297–310 (1982) 242

Number 3, July 1984

F. S. Foster, M. Strban, and G. Austin. The Ultrasound Macroscope: Initial Studies of Breast Tissue 243

Guy E. Mailloux, Michel Bertrand, Robert Stampfler, and Serge Ethier. Texture Analysis of Ultrasound B-Mode Images by Segmentation 262

L. S. Wilson, D. E. Robinson, and B. D. Doust. Frequency Domain Processing for Ultrasonic Attenuation Measurement in Liver 278
D. E. Robinson, L. S. Wilson, and T. Bianchi. Beam Pattern (Diffraction) Correction for Ultrasonic Attenuation Measurement 293
Jin H. Kim, Song B. Park, and Steven A. Johnson. Tomographic Imaging of Ultrasonic Reflectivity with Correction for Acoustic Speed Variations 304
Won K. Kim, Song B. Park, and Steven A. Johnson. Signal-to-Noise Ratio and Bandwidth for Pseudo-Random Codes in an Ultrasonic Imaging System 313
R. Oppelt and H. Ermert. Transfer Function Analysis of a Quasioptical Ultrasonic Imaging System 324

Note

Thomas M. Burke, Mitch M. Goodsitt, Ernest L. Madsen, and James A. Zagzebski. Angular Distribution of Scattered Ultrasound from a Single Steel Sphere in Agar Gelatin: A Comparison between Theory and Experiment 342

Number 4, October 1984

J. Ophir, T. H. Shawker, N. F. Maklad, J. G. Miller, S. W. Flax, P. A. Narayana, and J. P. Jones. Attenuation Estimation in Reflection: Progress and Prospects 349
Brian S. Garra, Thomas H. Shawker, Menahem Nassi, and Mary Ann Russell. Ultrasound Attenuation Measurements of the Liver *in Vivo* Using a Commercial Sector Scanner ... 396
K. A. Dines, P. W. Sheets, J. A. Brink, C. W. Hanke, K. A. Condra, J. L. Clendenon, S. A. Goss, D. J. Smith, and T. D. Franklin. High Frequency Ultrasonic Imaging of Skin: Experimental Results 408
G. Demoment, R. Reynaud, and A. Herment. Range Resolution Improvement by a Fast Deconvolution Method 435
Author Index for Volume 6 452
Subject Index for Volume 6 454